

# Biosynthetic potential for polyketides in Talaromyces atroroseus

**Rasmussen, Kasper Bøwig; Mortensen, Uffe Hasbro; Thrane, Ulf**

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# Biosynthetic potential for polyketides in *Talaromyces atroroseus*

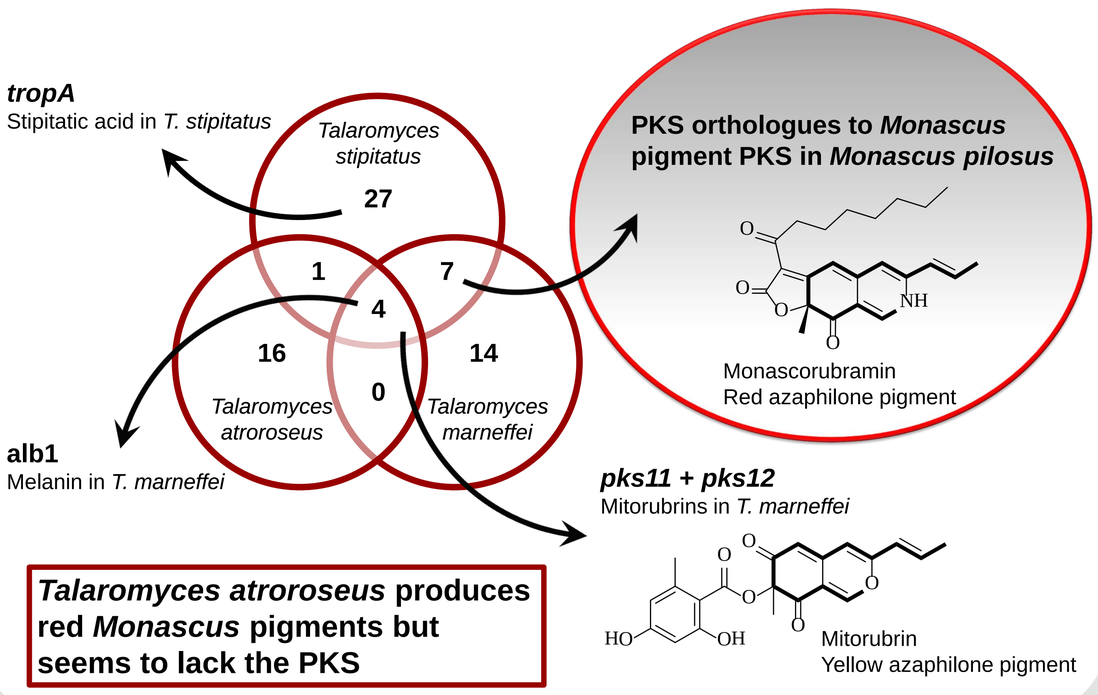
**K. B. Rasmussen[1], U. H. Mortensen[1], U. Thrane[1]**

[1]Department of Systems Biology, Technical University of Denmark, Kgs. Lyngby, Denmark

## Abstract

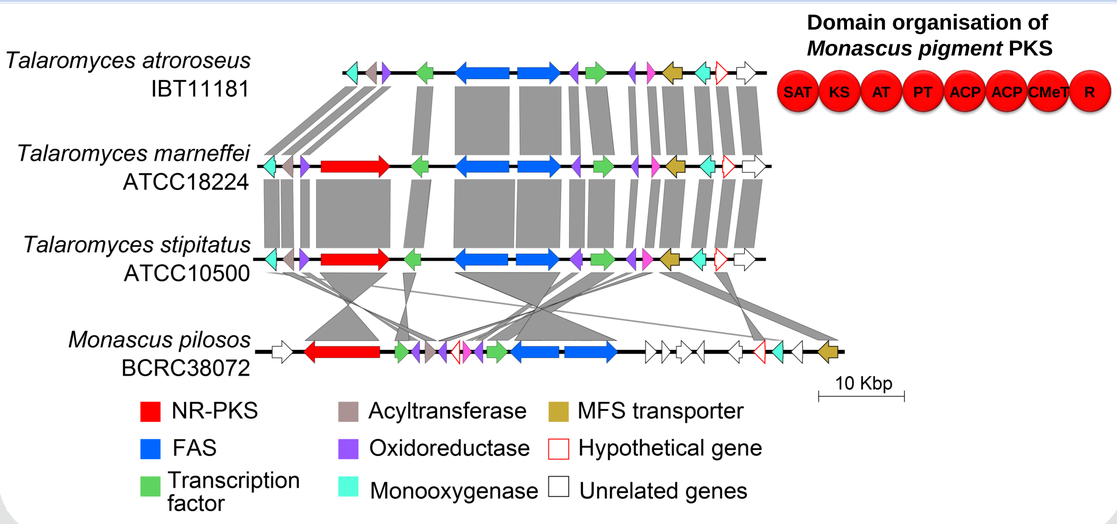
***Talaromyces atroroseus*** **is an efficient producer of red *Monascus* pigments. We genome sequenced *Talaromyces atroroseus* IBT11181 and found it to lack the *Monascus* pigment PKS with the rest of the *Monascus* pigment cluster intact. The PKS closest related to the *Monascus* pigment PKS is the mitorubrin PKS11, and deletion of PKS11 results in the loss of *Monascus* pigment production. *T. atroroseus* PKS11 is delivering a precursor for both the mitorubrins and the *Monascus* pigments. Based on this finding we propose hypothetical models for the evolution of azaphilone pigment PKS clusters in *Talaromyces* and *Monascus*.**

## 1. Polyketide synthases in genome sequenced *Talaromyces*

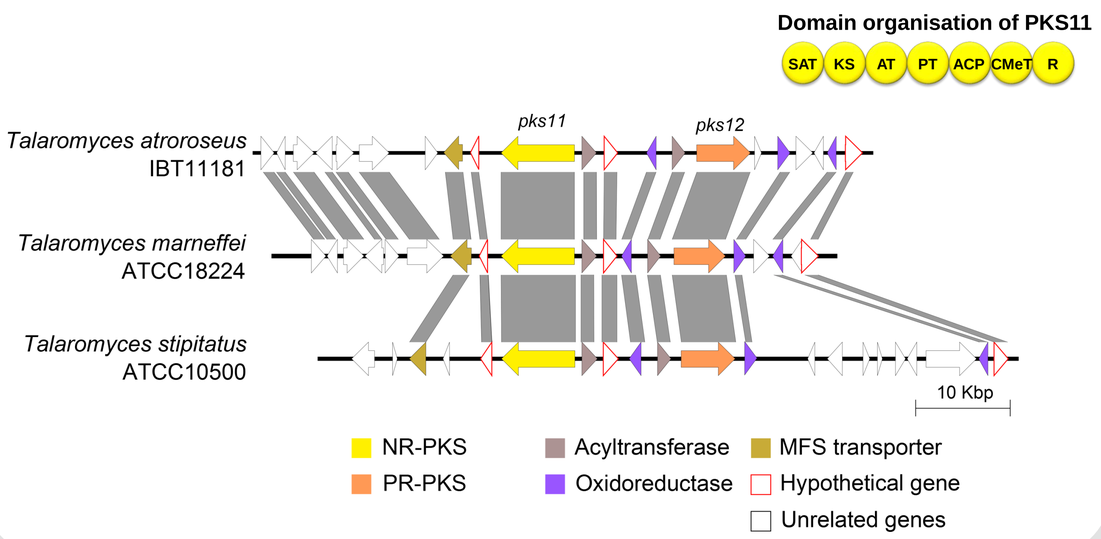



**_Talaromyces atroroseus_ produces red _Monascus_ pigments but seems to lack the PKS**

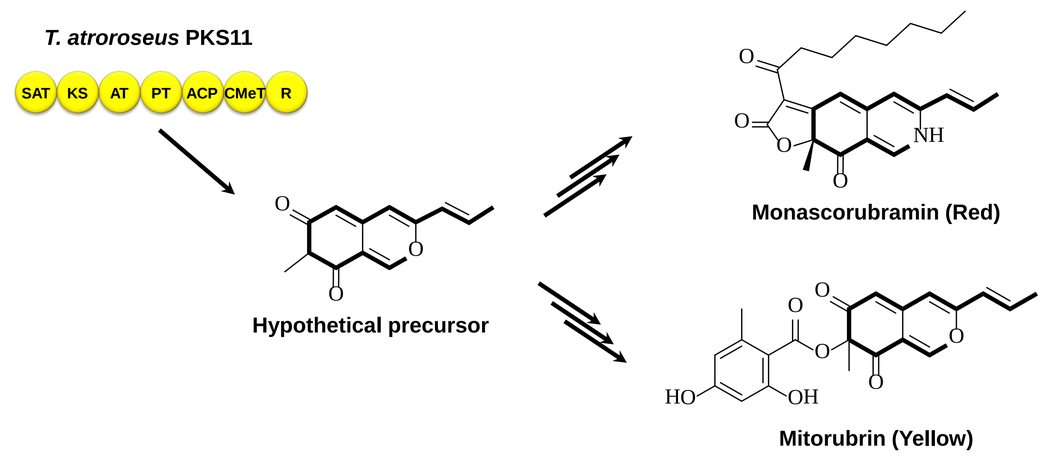
## 2. Synteny of *Monascus* pigment cluster *T. atroroseus* lacks the *Monascus* pigment PKS



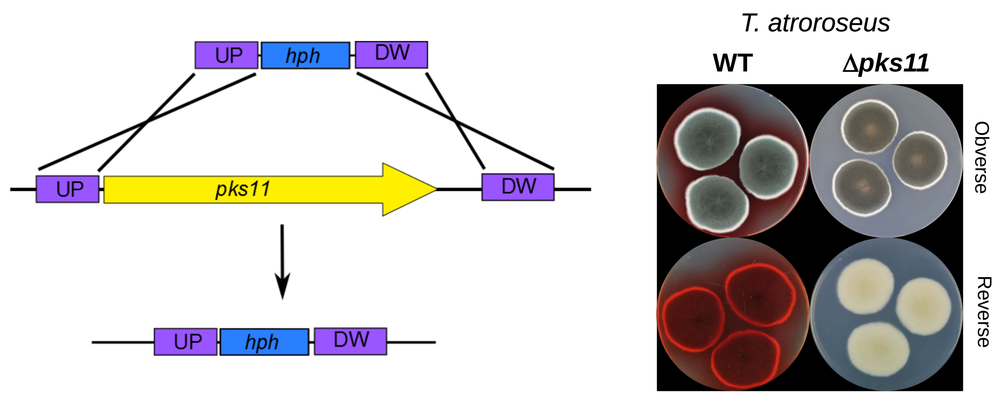

## 3. Synteny of mitorubrin cluster Cluster with PKS closest related to *Monascus* pigment PKS



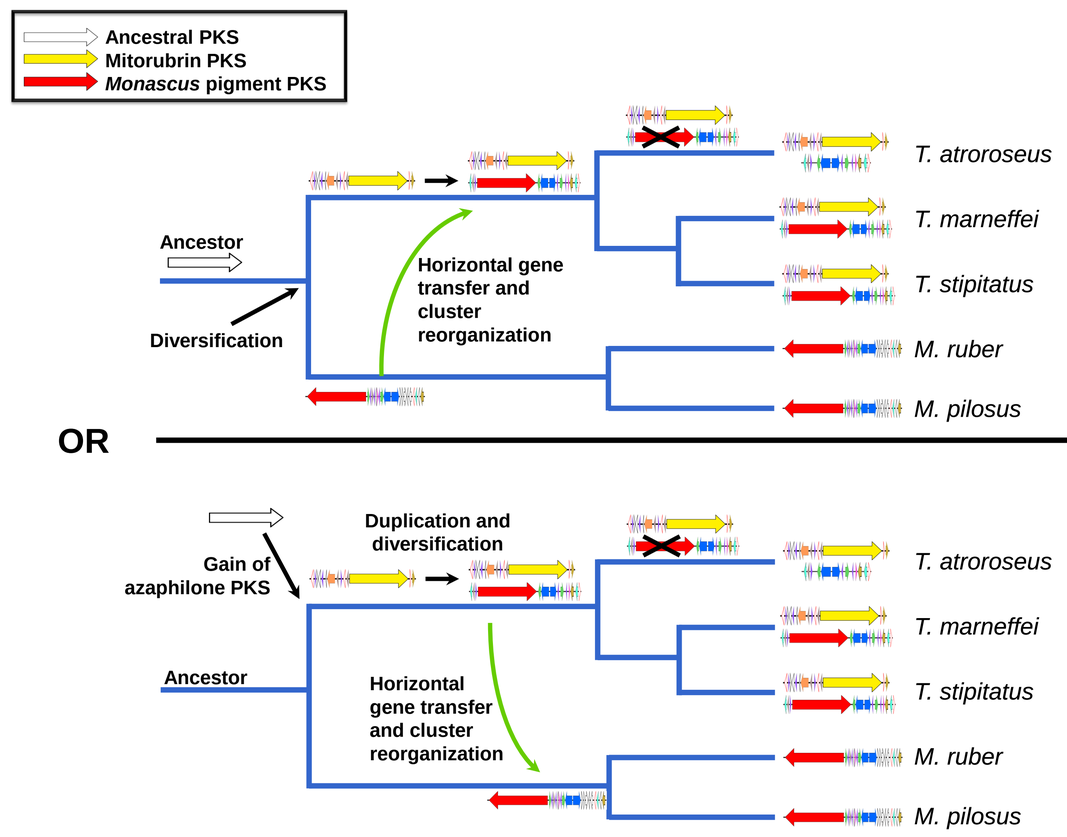

## 4. *T. atroroseus* PKS11 delivers precursor for both *Monascus* pigments and mitorubrins




## 5. Deletion of *pks11* in *T. atroroseus* results in loss of production of red *Monascus* pigments




## 6. Hypothetical evolution of azaphilone PKS clusters in *Talaromyces* and *Monascus*

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**Contact: kbr@bio.dtu.dk**